AMENDMENTS TO THE CLAIMS

1. (Currently amended) A multi-junction solar cell assembly comprising:

a transparent substrate;

a transparent conductive coating formed on the transparent substrate, said transparent conductive coating comprising gallium nitride to provide a defect-free surface for growing an InGaN solar cell;

a solar cell including a plurality of gallium indium nitride junction layers ~~formed~~ grown successively on the transparent conductive coating;

an indium nitride junction layer formed on the plurality of gallium indium nitride junction layers; and

a metallization layer formed on the indium nitride junction layer;

wherein each successive gallium indium nitride junction laver has a thickness greater than a thickness of the immediately preceding gallium indium nitride junction layer, each successive gallium indium nitride junction layer being directly adjacent the immediately preceding gallium indium nitride junction layer.

2. (Original) A multi junction solar cell assembly in accordance with claim 1 wherein the transparent substrate is selected from a group of transparent substrates consisting of sapphire, zinc oxide, and gallium nitride.

3. (Canceled).

4. (Currently amended) A multi junction solar cell assembly in accordance with claim 1 further comprising a gallium nitride junction layer ~~formed on the transparent conductive coating~~ between the transparent conductive coating and the plurality of gallium Indium nitride junction layers.

5. (Currently amended) The solar cell assembly of claim ~~24, A multi-junction solar cell assembly in accordance with claim 1~~ wherein the solar cell includes a ~~each layer of the~~ plurality of gallium indium nitride junction layers [[has]] having a thickness of between about 0.2 microns and about 1.0 microns.

6. (Canceled).

7. (Currently amended) The ~~A multi-junction~~ solar cell assembly of claim 5, ~~in accordance with claim 1~~ wherein each layer of the plurality of gallium indium nitride junction layers has a gallium content of between about 90 wt % and about 10 wt % and an indium content of between about 90 wt % and about 10 wt %.

8. (Currently amended) The solar cell assembly of claim 5,~~A multi-junction solar cell assembly in accordance with claim 1, further comprising at least three gallium indium nitride junction layers,~~ wherein each successive layer of the plurality of gallium indium nitride junction layers has a gallium content less than the immediately preceding layer of the plurality of gallium indium nitride junction layers and an indium content greater than the immediately preceding layer of the plurality of gallium indium nitride junction layers.

9. (Currently amended) The solar cell assembly of claim 5, ~~A multi-junction solar cell assembly in accordance with claim 1~~ wherein each layer of the plurality of gallium indium nitride junction layers has a band gap of between about 0.7 eV and about 3.4 eV.

10. (Currently amended) The solar cell assembly of claim 5, ~~A multi-junction solar cell assembly in accordance with claim 1~~ wherein each successive layer of the plurality of gallium indium nitride junction layers has a band gap less than the band gap of the immediately preceding layer of the plurality of gallium indium nitride junction layers.

11. (Currently amended) The solar cell assembly of claim 25 ~~24~~, ~~A multi junction solar cell assembly in accordance with claim 1~~ wherein the transparent conductive coating comprises:

a nucleation layer formed on the sapphire cover~~transparent substrate~~;

a lateral epitaxial overgrowth layer of gallium nitride formed on the nucleation layer; and

a defect-free gallium nitride layer formed on the lateral epitaxial overgrowth layer.

12. (Currently amended) The ~~A multi-junction~~ solar cell assembly of ~~in accordance with~~ claim 11, wherein the nucleation layer comprises:

an aluminum nitride coating formed directly on the sapphire cover~~transparent substrate~~ in intimate contact with the sapphire cover~~transparent substrate~~; and

a seed layer of gallium nitride formed on the aluminum nitride coating.

13. (Currently amended) The ~~A multi-junction~~ solar cell assembly of claim 25 ~~24, in accordance with claim 1~~ wherein the transparent conductive coating comprises:

a plurality of alternating layers of gallium nitride and aluminum gallium nitride; and

a plurality of quantum wells, each quantum well of the plurality of quantum wells formed at a corresponding interface between adjacent layers of gallium nitride and aluminum gallium nitride of the plurality of alternating layers of gallium nitride and aluminum gallium nitride.

14. (Currently amended) The solar cell assembly of ~~A multi junction solar cell assembly in accordance with~~ claim 13 wherein a first gallium indium nitride junction layer of the plurality of gallium indium nitride junction layers is formed directly on a last gallium nitride layer of the plurality of alternating layers of gallium nitride and aluminum gallium nitride in intimate contact with the last

gallium nitride layer of the plurality of alternating layers of gallium nitride and aluminum gallium nitride.

15. (Original) A multi junction solar cell assembly in accordance with claim 1 wherein the transparent conductive coating comprises a gallium nitride layer formed on the transparent substrate.

16. (Currently amended) The ~~A multi junction~~ solar cell assembly of claim 5, ~~in accordance with claim 1~~ further comprising a metal current collector bus for receiving electrical power collected from the plurality of gallium indium nitride junction layers by the transparent conductive coating.

Claims 17-19 (Cancelled)

20. ~~19.~~ (Currently amended) A method of forming a unitary multi junction solar cell assembly comprising ~~the steps of~~:

forming a transparent conductive coating including gallium nitride on a sapphire cover~~substrate~~; and

~~forming~~ growing a solar cell including a plurality of gallium indium nitride junction layers on the transparent conductive coating without taking any measures to correct for lattice mismatch. ~~, wherein each successive gallium indium nitride junction layer has a thickness greater than a thickness of the immediately preceding gallium indium nitride junction layer, each successive gallium indium nitride junction layer being directly adjacent the immediately preceding gallium indium nitride junction layer; and~~

~~forming a metallization layer on the plurality of gallium indium nitride junction layers, wherein the metallization layer is selected from a group that includes a layer of aluminum, a layer of chromium, and a layer of titanium.~~

21. ~~20.~~ (Currently amended) A method in accordance with claim ~~19~~ 20 further comprising forming a metallization layer on the plurality of gallium indium

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nitride junction layers, wherein the metallization layer is selected from a group that includes a layer of aluminum, a layer of chromium, and a layer of titanium; and forming an Indium nitride junction layer on the plurality of gallium indium nitride junction layers between the metallization layer and the plurality of gallium indium nitride junction layers.

22. ~~21.~~ (Original) A method in accordance with claim 20 ~~19~~ further comprising forming a gallium nitride junction layer on the transparent conductive coating between the transparent conductive coating and the plurality of gallium indium nitride junction layers.

23. ~~22.~~ (Cancelled)

24. ~~23.~~ (Cancelled)

25. ~~24.~~ (New) A solar cell assembly comprising:

a sapphire cover;

a GaN transparent conductive coating (TCC) as front collector, the GaN TCC formed on the sapphire cover; and

a multjunction InGaN solar cell grown on a GaN layer of the TCC;

wherein the GaN TCC provides a defect-free surface upon which the InGaN solar cell is grown.